

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of)
)
Amendment of Part 2 of the Commission's)
Rules to Allocate Spectrum Below 3 GHz) ET Docket No. 00-258
for Mobile and Fixed Services to Support)
the Introduction of New Advanced)
Wireless Services, including Third)
Generation Wireless Systems)

REPLY COMMENTS

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EXECUTIVE SUMMARY

The Commission must determine in this proceeding whether the putative benefits of clearing the 2150-2162 MHz band (the “2.1 GHz band”) and 2500-2690 MHz band (the “2.5 GHz band”) for so-called third generation (“3G”) mobile wireless systems outweigh the crippling impact of either a forced relocation of Multipoint Distribution Service (“MDS”) and/or Instructional Television Fixed Service (“ITFS”) licensees or a reduction in the spectrum available to those services. MDS and ITFS are essential to the deployment of wireless broadband networks that serve unserved and underserved areas and compete with incumbent local exchange carriers (“ILECs”) and cable companies already entrenched in the broadband marketplace, and the public interest benefits of this advanced wireless service cannot be ignored. The comments filed in response to the Commission’s *Notice of Proposed Rule Making* (“NPRM”) overwhelmingly confirm that neither the 2.1 nor 2.5 GHz bands should be reallocated for 3G. Therefore, when the Commission releases its *Final Report* on the MDS/ITFS allocation later this month, it should make crystal clear that the 2.1 and 2.5 GHz bands are not available to be reallocated for 3G.

As is evident from the comments of the mobile equipment vendors and mobile service providers, there are substantial public interest benefits to making spectrum in the 1.7 GHz band available for 3G services, and very good reasons why reallocation of the 2.5 GHz band will not materially promote the objectives of rapid 3G deployment and global harmonization. Indeed, it is indicative of the mobile industry’s preference for the 1.7 GHz band that the mobile community has largely failed to address the thorny issues raised by any potential modification of the 2.1 and 2.5 GHz spectrum allocations. The *NPRM* quite clearly asked commenting parties to address, among other things, the impact relocation would have on commercial and educational broadband services in the 2.1 and 2.5 GHz bands, whether any comparable replacement spectrum is available for MDS/ITFS incumbents, how MDS/ITFS incumbents could be accommodated in any identified replacement spectrum given the highly-complex licensing schemes that have been employed in the two services, and whether the Commission’s existing relocation procedures are appropriate for the MDS/ITFS service. The *NPRM* also asked commenting parties to consider that “the band has already been auctioned to MDS licensees and that the current MDS/ITFS sharing and leasing arrangements in this band are complex.” Yet, the mobile industry’s comments offer no substantive response to these inquiries.

In contrast, the MDS/ITFS community demonstrates: (i) that there is no replacement spectrum available to which MDS or ITFS could be relocated, (ii) that any reduction in spectrum available to MDS/ITFS would cripple the deployment of broadband wireless services, (iii) that there will be serious legal issues and policy implications for future auctions should the Commission repossess and reauction spectrum in the 2.1 and 2.5 GHz bands that has already been auctioned to and paid for by incumbents who have invested billions of dollars in reliance on continuing access to that spectrum, (iv) that commercial operators, with the express encouragement of the Commission, have entered into long term leases with ITFS licensees, and that there are significant legal, public policy and economic consequences associated with

disrupting those leases via relocation of ITFS incumbents to other spectrum, and (v) that MDS/ITFS-based wireless broadband is a highly complex, mass-market consumer service that, were replacement spectrum available, would require relocation rules that are far different from those crafted in the past for point-to-point microwave services.

In short, the position of the handful of mobile operators and equipment vendors that support relocating MDS/ITFS incumbents is, essentially, “just do it.” To this small group of commenters, the substantial and unprecedented legal, technical, economic and public policy implications of relocating MDS/ITFS incumbents, reauctioning their spectrum and halting the rollout of MDS/ITFS-based wireless broadband services are mere inconveniences that merit no substantive discussion. This is not entirely surprising, since the mobile carriers who are most aggressive in calling for reallocation of the 2.1 and 2.5 GHz bands include affiliates of the incumbent cable operators and ILECs that operate wireline cable modem and DSL services and stand to benefit significantly from disruption or elimination of the competition provided by the ongoing roll-out of MDS/ITFS-based wireless broadband service. Of course, the self-interest of these carriers is not the public interest - the Commission’s overriding objective in this proceeding is to *expand* consumer choice by promoting deployment of *all* “advanced wireless services,” including MDS/ITFS-based wireless broadband.

Furthermore, the comments reflect that new technical rules and a modest guardband are necessary to assure that 3G and MDS can peacefully co-exist using adjacent or nearby bands in the 2110-2162 MHz range. WCA would not oppose revision of the 2.1 GHz MDS downstream spectral mask requirement to reflect current technology and assure increased protection to 3G operations, so long as the Commission imposes appropriate spectral mask requirements and power limits on 3G service providers to assure that 3G services do not cause harmful interference to 2.1 GHz MDS. In this manner, the Commission can minimize the size of the inevitable guardband between the two services.

Finally, the Commission should not, as has been suggested by certain mobile carriers, accommodate 3G usage by moving MDS incumbents in the 2.1 GHz band to 2155-2165 MHz. This suggestion ignores that in fifty of the largest markets in the nation, MDS channel 2 is a full 6 MHz, so that 12 MHz is necessary to accommodate both MDS channel 1 and channel 2. Moreover, while it is correct that this approach would require only a single guardband between MDS and 3G, it ignores the fact that the 2162-2165 MHz band provides a guardband between MDS operations at 2150-2162 MHz and Mobile Satellite Service (“MSS”) operations in the 2165-2200 MHz band. Further, there are complex, and perhaps insurmountable, hurdles that would have to be overcome in order to accomplish the proposed transition while meeting the absolutely essential requirement that service to customers not be disrupted.

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REPLY COMMENTS

The Wireless Communications Association International, Inc. ("WCA") hereby submits its reply to the comments submitted in response to the *Notice of Proposed Rule Making* (the "*NPRM*") in this proceeding.

I. INTRODUCTION.

The critical question before the Commission is this: do the putative benefits of clearing the 2150-2162 MHz (the "2.1 GHz band") and the 2500-2690 MHz band (the "2.5 GHz band") for so-called third generation ("3G") mobile service outweigh the crippling impact any forced relocation of Multipoint Distribution Service ("MDS") and/or Instructional Television Fixed Service ("ITFS") licensees to other bands or any reduction in the MDS/ITFS spectrum allocation would have on the deployment of fixed wireless broadband networks? The initial comments submitted in this proceeding firmly establish that the answer is "no" – the public interest benefits of MDS/ITFS broadband offerings that serve unserved and underserved areas and compete with incumbent local exchange carriers ("ILECs") and cable modem service providers are far greater.

In its initial comments, WCA and a myriad of broadband service providers, equipment vendors, and MDS and ITFS licensees demonstrated that:

- C MDS/ITFS-based wireless broadband service is an essential component of the Commission's broader effort to accelerate deployment of broadband services;^{1/}
- C co-channel frequency sharing between 3G and MDS/ITFS systems is not feasible;^{2/}
- C the ability of MDS/ITFS-based wireless broadband service to compete with ILECs and cable modem service and to reach unserved or underserved areas in a timely and cost-efficient manner is inextricably tied to the unique propagation characteristics of the 2.1 and 2.5 GHz bands;^{3/}
- C no suitable relocation spectrum for MDS/ITFS incumbents exists;^{4/}
- C even were relocation spectrum available, any relocation of MDS/ITFS incumbents out of the 2.1 and 2.5 GHz bands would represent an unprecedented forced displacement of a mass market, consumer-based broadband service, and as such would cause inestimable damage to MDS/ITFS operators, consumers, educators, students and the public interest which the Commission's current relocation procedures were not designed to address;^{5/}
- C any reduction in the amount of spectrum available to MDS/ITFS-based networks at 2.1 or 2.5 GHz would have a significant adverse impact on the economic viability of wireless

^{1/} Comments of The Wireless Communications Association International, Inc., ET Docket No. 00-258, at 8-21 (filed Feb. 22, 2001) [hereinafter cited as "WCA Comments"]; *see also, e.g.*, Comments of Sprint Corporation, ET Docket No. 00-258, at 4-5 (filed Feb. 22, 2001) [hereinafter cited as "Sprint Comments"].

^{2/} WCA Comments at 26-29 and Appendix A, "Interference to 3G Systems from ITFS/MDS Systems Sharing the Same Frequencies," prepared by George W. Harter, Director of Broadband Engineering, MSI; *see also, e.g.*, Comments of WorldCom, Inc., ET Docket No. 00-258, at 21-22 (filed Feb. 22, 2001) [hereinafter cited as "WorldCom Comments"].

^{3/} WCA Comments at 22-25; Sprint Comments at 25; Comments of Nucentrix Broadband Networks, Inc., ET Docket No. 00-258, at 20-22 (filed Feb. 22, 2001) [hereinafter cited as "Nucentrix Comments"].

^{4/} WCA Comments at 30-32; Sprint Comments at 25; Nucentrix Comments at 15.

^{5/} WCA Comments at 48-53; Sprint Comments at 26-28.

broadband service, and thus would endanger the deployment of broadband service that the Commission seeks to promote;^{6/}

C with the Commission's encouragement, ITFS licensees receive indispensable economic support for their on-campus and distance learning initiatives by leasing a substantial portion of the 2.5 GHz band for commercial MDS/ITFS service, and thus any relocation of ITFS incumbents that disrupts such lease arrangements would raise additional legal and public policy issues;^{7/}

C the Commission cannot repossess and reacquire the 2.1 and 2.5 GHz bands without infringing upon the rights it has previously sold to MDS BTA auction winners and undermining future auction efforts;^{8/}

C ample alternative spectrum is available for 3G services;^{9/} and,

C reallocation of the 2.5 GHz band for 3G will not promote global harmonization of spectrum.^{10/}

MDS/ITFS-based wireless broadband system operators, equipment suppliers, ITFS licensees and others in the educational community all testify to the significant and irreparable adverse effects of any forced relocation of MDS/ITFS incumbents or reduction in the amount of spectrum available to them at 2.1 and 2.5 GHz.^{11/} Indeed, Sprint Corporation ("Sprint"),

^{6/} WCA Comments at 38-40 and Appendix B, "MDS/MMDS/ITFS Two-Way Fixed Wireless Broadband Service: Spectrum Requirements and Business Case Analysis," prepared by HAI Consulting, Inc.; Comments of Cisco Systems, Inc., ET Docket No. 00-258, at 10-11 (filed Feb. 22, 2001) [hereinafter cited as "Cisco Comments"]; Comments of IPWireless, Inc., ET Docket No. 00-258, at 12-13 (filed Feb. 22, 2001) [hereinafter cited as "IPWireless Comments"]; Nucentrix Comments at 8-12.

^{7/} WCA Comments at 51-52; IPWireless Comments at 11-12; WorldCom Comments at 15-16.

^{8/} WCA Comments at 45-48; Nucentrix Comments at 12-14; Sprint Comments at 25-26; WorldCom Comments at 10-12.

^{9/} WCA Comments at 54-56; Sprint Comments at 32; Nucentrix Comments at 32-33.

^{10/} WCA Comments at 57-60; Sprint Comments at 33-36.

^{11/} See, e.g., Sprint Comments; WorldCom Comments; Nucentrix Comments; Joint Comments of ITFS Parties, ET Docket No. 00-258 (filed Feb. 22, 2001) [hereinafter cited as "ITFS Parties Comments"]; Comments of Catholic Television Network, ET Docket No. 00-258 (filed Feb. 22, 2001) [hereinafter

whose MDS/ITFS-based Broadband Direct Service is already serving over 25,000 subscribers and signing up 7,000 new customers a month, minces no words on the subject:

If the Commission were to adopt any of the band segmentation options that it proposed in the *Interim Report*, Sprint likely would cease providing its Broadband DirectSM service. Sprint requires access to the entire 2.1 and 2.5 GHz bands to provide its service, and any diminution of the spectrum to which it enjoys access today would render its business plans useless.^{12/}

WorldCom, Inc. (“WorldCom”) who like Sprint is making a multi-billion dollar investment in MDS/ITFS-based broadband service, also notes that “[w]ithout access to all of the available MDS/ITFS spectrum, deployment in most markets in the United States becomes economically nonviable.”^{13/} Nucentrix Broadband Networks, Inc. (“Nucentrix”), which too has made an enormous investment in providing MDS/ITFS-based wireless broadband service in small to mid-sized markets, makes clear that “[a]ny loss of spectrum in [the small cities and rural areas that form the heart of Nucentrix’s service area] would render service uneconomic, and force cancellation of Nucentrix’s deployment plans.”^{14/}

cited as “CTN Comments”]; Comments of National ITFS Association, ET Docket No. 00-258 (filed Feb. 22, 2001) [hereinafter cited as “National ITFS Comments”]; Comments of Association of Public Television Stations, ET Docket No. 00-258 (filed Feb. 22, 2001) [hereinafter cited as “APTV Comments”].

^{12/} Sprint Comments at 20; *see also id.* at i (“If the Commission attempts to reduce by any amount the spectrum available for broadband fixed wireless services, Sprint cannot offer commercially viable, competitive broadband services at 2.1 GHz and 2.5 GHz.”), 22-23 (“If the amount of spectrum available to Sprint is reduced, dramatic cost increases will occur in every market in which Sprint is providing, or plans to provide, service, making the service economically infeasible.”).

^{13/} WorldCom Comments at 21; *see also id.* at 4-5 (“WorldCom plans to deploy [MDS/ITFS wireless broadband service] to many smaller markets, and WorldCom will provide significant coverage of surrounding rural areas. These prospective customers are not now, and may never be, served by DSL or cable modem providers due to economic and/or technical reasons.”).

^{14/} Nucentrix Comments at 11; *see also* IPWireless Comments at 12 (“Continued regulatory uncertainty as to the future status of the current MDS/ITFS band threatens to stall the deployment of advanced

In addition, MDS/ITFS equipment suppliers have confirmed that relocation of MDS/ITFS incumbents or any reduction of spectrum available to them in the 2.1 and/or 2.5 GHz bands would have a debilitating and potentially fatal impact on MDS/ITFS-based broadband deployment in the United States. For example, Cisco Systems, Inc. (“Cisco”), one of the leading manufacturers of infrastructure for the MDS/ITFS industry, states that segmentation of a portion of the 2.5 GHz band for 3G would require a massive equipment redesign and manufacturing effort that would substantially delay market entry for new MDS/ITFS broadband systems.^{15/}

Similarly, Nortel Networks Inc. (“Nortel”) argues that:

[A]n allocation [of the 2.5 GHz band for 3G] would disrupt the business plans of the incumbent licensees. These service providers (as well as manufacturers) have developed and begun to implement changes to their operations in response to the Commission’s recent determination to allow two-way digital fixed services in this band, and an abrupt change in policy would seriously hamper these efforts to enhance advanced services competition.^{16/}

Furthermore, the vigorous response of literally hundreds of ITFS licensees and other educators with ITFS-related interests speaks volumes about the indispensable technical,

broadband wireless services in this band. From a business standpoint, regulatory uncertainty makes planning and budgeting for system and equipment design, development and deployment, exceedingly difficult. The more likely it appears that the 2.5 GHz band will be even partially reallocated and re-licensed, the less likely commercial operators are to continue to devote resources to these activities, and the less likely that entrepreneurial U.S. commercial operators will be able to raise additional capital for the deployment of broadband wireless services in this band.”).

^{15/} Cisco Comments at 10-11.

^{16/} Comments of Nortel Networks Inc., ET Docket No. 00-258, at ii (filed Feb. 22, 2001) [hereinafter cited as “Nortel Comments”].

operational, and economic support that commercial operators provide to the ITFS service.^{17/} As the National ITFS Association (“NIA”) points out:

Wireless broadband system operators have made clear to ITFS licensees that, if any portion of the 2500-2690 MHz band is reallocated for 3G mobile services, their fundamental technical and business plans for the provision of fixed wireless broadband services in the band will be so seriously compromised that the rollout of such services will come to an end. Without the support of these system operators, even ITFS licensees whose spectrum is not taken (those in the band segments retained for ITFS) will lose technical, operational and financial support for their educational operations.

Thus, taking any of the 2500-2690 MHz band, as contemplated in the FCC’s segmentation options, will result in the near total loss of the educational value provided by ITFS, as described earlier in these comments, and of the commercial and public value of fixed wireless broadband services.^{18/}

While the *NPRM* called upon proponents of reallocating the MDS/ITFS spectrum to substantiate their need for the additional spectrum to provide 3G services, those few who do seek such a reallocation have relied on rhetoric, rather than providing the Commission with any substantive data.^{19/} In contrast, the MDS/ITFS community has provided the Commission with

^{17/} See, e.g., ITFS Parties Comments; CTN Comments; National ITFS Comments; APTV Comments; Comments of Community Telecommunications Network, ET Docket No. 00-258 (filed Feb. 22, 2001); Comments of The Education Community of the United States, ET Docket No. 00-258 (filed Feb. 22, 2001); Comments of Education Service Center Region 9 and the Texas ITFS Community, ET Docket No. 00-258 (filed Feb. 22, 2001); Comments of The K-12 Community, ET Docket No. 00-258 (filed Feb. 22, 2001); Comments of The University of North Carolina, ET Docket No. 00-258 (filed Feb. 22, 2001).

^{18/} National ITFS Comments at 31.

^{19/} See, e.g., Comments of Cingular Wireless LLC, ET Docket No. 00-258, at 15 (filed Feb. 22, 2001) (“[T]he Commission *must* allocate at least 160 MHz of additional *clear* spectrum below 3 GHz for competitive advanced wireless services. . . . The bulk of the spectrum allocated for 3G services should come from one of two bands – the 1710-1850 MHz band or the 2500-2690 MHz band.”) (emphasis added in part) [hereinafter cited as “Cingular Comments”]; Comments of Verizon Wireless, ET Docket No. 00-258, at 7 (filed Feb. 22, 2001) (“The U.S. government *must* make substantial amounts of additional spectrum available to satisfy the growing demand for mobile services and facilitate the next generation of wireless technology. . . . The Commission *must*, therefore, move quickly to allocate those bands identified in this rulemaking to support the development of 3G. . . .”) (emphasis added) [hereinafter cited

economic and technical studies to support its position that any reduction in the MDS/ITFS spectrum allocation would have dramatic adverse implications for the deployment of much needed wireless broadband services. Indeed, none of those attempting to grab the 2.1 and 2.5 GHz bands even acknowledge the public interest benefits of MDS/ITFS wireless broadband service, much less attempt to seriously discuss the thorny legal and public policy issues that would have to be resolved to avoid the harm to MDS/ITFS operators, consumers, educators and students that would arise from taking spectrum away from MDS/ITFS at 2.1 and 2.5 GHz. The advocates of reallocating the MDS/ITFS bands are mute on identifying comparable relocation spectrum for MDS/ITFS, on how the Commission's relocation procedures could possibly be applied to MDS/ITFS given the mass market, consumer-based nature of MDS/ITFS wireless broadband service, and on how reallocation can be squared with the fact that commercial operators have already bought and paid for 2.1 and 2.5 GHz spectrum at auction.

Simply stated, the record developed in response to the *NPRM* provides the Commission with no legitimate justification for subjecting MDS/ITFS operators to the crippling effects of reallocating and reauctioning the 2.1 and 2.5 GHz bands for the benefit of 3G.^{20/} For the reasons

as "Verizon Comments"]; Comments of Telephone and Data Systems, Inc., ET Docket No. 00-258, at 10 (filed Feb. 22, 2001) ("The FCC *must* focus on the long term best economic interests of the country. . . . As long as existing non-mobile licensees. . . are compensated and receive reasonably comparable facilities on workable frequency bands, they will suffer no detriment.") (emphasis added) (footnote omitted) [hereinafter cited as "TDS Comments"].

^{20/} Indeed, it is ironic that the Universal Wireless Communications Consortium ("UWCC") would submit comments criticizing the willingness of the MDS/ITFS industry to provide information in response to the *NPRM* when UWCC and the proponents of reallocating the MDS/ITFS spectrum have so often failed to respond to the specific questions raised in the *NPRM*. See Comments of Universal Wireless Communications Consortium, ET Docket No. 00-258, at 7 (filed Feb. 22, 2001) [hereinafter cited as "UWCC Comments"]. Indeed, the extensive filings by MDS/ITFS-based broadband system operators and MDS and ITFS licensees that were placed in the record in response to the *NPRM* effectively refute

set forth below, the Commission can and should respond by assuring MDS/ITFS operators (and, consequently, consumers, educators and students) that their multi-billion dollar investment in wireless broadband will not be for naught, and that the ongoing nationwide deployment of MDS/ITFS wireless broadband service may continue unabated without any threat that the 2.1 and 2.5 GHz bands will be reallocated for 3G.

II. DISCUSSION.

A. THE RECORD REFLECTS THAT TO THE EXTENT ANY ADDITIONAL SPECTRUM IS REQUIRED FOR 3G, THE PUBLIC WILL BEST BE SERVED BY REALLOCATION OF THE 1.7 GHZ BAND.

The response of the wireless industry to the *NPRM* reaffirms what the industry has already stated publicly -- that the 1.7 GHz band (1710-1850 MHz), not the 2.1 and 2.5 GHz bands, is the mobile industry's "first choice" for 3G spectrum.^{21/} In fact, this sentiment is echoed throughout the mobile industry's comments in this proceeding.^{22/} Cook Inlet Region, Inc. ("Cook Inlet"), for example, argues that "spectrum allocated [for 3G] should be contiguous to existing PCS spectrum. . . . 3G services will have a greater chance of commercial success if the spectrum allocated to support these services will facilitate the joint marketing and provision of

UWCC's assertion that "2.5 GHz licensees are reluctant to candidly discuss and document current and projected consumer benefits provided by these licensees." *Id.*

^{21/} See Greczyn, "Wireless Industry Eyes Military Spectrum as First Choice for 3G," *Communications Daily*, at 1 (Feb. 14, 2001).

^{22/} See, e.g., Verizon Comments at 11; Cingular Comments at 15; Comments of QUALCOMM Incorporated, ET Docket No. 00-258, at 13-14 (filed Feb. 22, 2001) [hereinafter cited as "Qualcomm Comments"]; Joint Comments of Cellular Telecommunications and Internet Association, Telecommunications Industry Association, Personal Communications Industry Association, ET Docket No. 00-258, at 1 (filed Feb. 22, 2001) [hereinafter cited as "Mobile Industry Association Comments"].

3G data services with existing voice services.”^{23/} AT&T Wireless Services, Inc. (“AT&T”) expresses a strong preference for access to the 1.7 GHz band, and makes clear that the 2.5 GHz band is a poor second choice.^{24/} Cingular Wireless, LLC (“Cingular”) also confirms that the 1.7 GHz band is its preference, and that the Commission should only resort to clearing the 2.5 GHz band if “clearing [the 1.7 GHz band] proves impractical.”^{25/} And, the report of the Industry Association Group submitted by the Cellular Telecommunications & Internet Association, Telecommunications Industry Association and Personal Communications Industry Association concludes that “all or most of the 1710-1850 MHz band can be made available for 3G services through a combination of geographic or time sharing with some of the incumbent services and relocation of incumbents when sharing is not feasible.”^{26/}

Those views are largely reinforced by the vendor community. Motorola, Inc. (“Motorola”), for example, urges the allocation of the 1710-1850 MHz and 2110-2150/2160-2165 MHz bands for 3G, and notes that “it is unlikely that [the 2.5 GHz] band can offer a near term solution for 3G spectrum.”^{27/} Nortel Networks Inc. (“Nortel”), Lucent Technologies (“Lucent”),

^{23/} Comments of Cook Inlet Region, Inc., ET Docket No. 00-258, at 4-5 (filed Feb. 22, 2001) [hereinafter cited as “Cook Inlet Comments”].

^{24/} See Comments of AT&T Wireless, ET Docket No. 00-258, at 9, 13-14 (filed Feb. 22, 2001) (stating that allocation of 1710-1755 MHz and 1755-1850 MHz bands for 3G “is consistent with the proposals of the majority of manufacturers and service providers that have indicated a preference on 3G plans” and “best balances the needs of government users with the commercial demand for spectrum for advanced wireless services”) [hereinafter cited as “AT&T Comments”].

^{25/} Cingular Comments at 15.

^{26/} Mobile Industry Association Comments at ii.

^{27/} Comments of Motorola, Inc., ET Docket No. 00-258, at 13 (filed Feb. 22, 2001) [hereinafter cited as “Motorola Comments”].

Siemens Corporation (“Siemens”) and QUALCOMM Incorporated (“Qualcomm”) all urge the Commission to allocate the 1710-1755 MHz and 1805-1850 MHz bands for 3G.^{28/} Their reasoning for supporting the 1.7 GHz band, rather than the 2.5 GHz band, is instructive. For example, Nortel notes that:

Allocation of [the 1710-1750 and 1805-1850 MHz] bands in the United States would align 3G spectrum in this country with the 1.8 GHz band plan used by 2G mobile systems in operation in many other parts of the world, including Europe. Such an overlap would simplify the design of equipment for the global mobile market and facilitate 3G harmonization by enhancing the incentives for regulators in Europe and the rest of the world to allow these frequencies to be used eventually for 3G services. The harmonization in turn will also allow manufacturers (and hence consumers) to enjoy the full advantage of scale economies derived from producing equipment for a global marketplace. In addition, the overlap with 1.8 GHz based services will allow manufacturers to take advantage of the research and development work that has already occurred in connection with designing mobile services equipment that operates in these bands. *Thus, allocation of the 1710-1755 MHz and 1805-1850 MHz bands would provide numerous advantages, particularly compared to some of the other bands under consideration.*^{29/}

Siemens notes that “[t]he strategic advantages of this proposal are:

- (1) It provides a reasonable paired band of up to 2 x 45 MHz for IMT-2000 to get started in the US and many other countries
- (2) It allows compatible international roaming with a growing number out of 60 countries who will use this band from the beginning for IMT-2000 or transform it from 2G to 3G over time
- (3) It allows true global roaming with the many countries using the original IMT-2000 core band based on dual-band IMT-2000 terminals enabled by the similarity of the spectrum allocations
- (4) A US adoption will be the catalyst for an evolution of the 1800 MHz band to another widely accepted IMT-2000 core band

^{28/} Nortel Comments at 5-6; Comments of Lucent Technologies, Inc., ET Docket No. 00-258, at 12 (filed Feb. 22, 2001) [hereinafter cited as “Lucent Comments”]; Comments of Siemens Corporation, ET Docket No. 00-258, at 33 (filed Feb. 22, 2001) [hereinafter cited as “Siemens Comments”]; Qualcomm Comments at 13-14.

^{29/} Nortel Comments at 6 (emphasis added).

- (5) It limits the number of paired IMT-2000 core bands to two worldwide and allows cost effective dual-band mobile stations.”^{30/}

The record further establishes that pairing the 2.5 GHz band with any of the other spectrum bands under consideration would be unworkable. Lucent takes note of

the potential difficulties that could arise if duplex spacing is overly wide, providing a large separation between uplink and downlink, (for example, if the 1.7 GHz band were paired with the 2.5 GHz band). Such an arrangement could require the use of distinct antennas for each (uplink and downlink) direction of transmission, which would add to the cost of deployment.^{31/}

Motorola voiced similar concerns – arguing that “equipment spanning the 1700 and 2500 MHz bands is not used elsewhere in the world and would require substantial development costs to accomplish operating over such a large duplex spacing.”^{32/} Siemens, too, argues vigorously against pairing the 2.5 GHz band with either the 2110-2150/2160-2165 MHz band or the 1710-1755 MHz band, noting that:

The first sub-option (2110-2150/2160-2165 paired with 2500-2690) would not allow roaming with single-band terminals since only one link would be common with countries using 1920-1980 paired with 2110-2170 MHz. Therefore this sub-option should not be adopted.

The second sub-option (1710-1755 paired with 2500-2690 MHz) would cannibalize two bands designated by the ITU for IMT-2000, the 1800 MHz and the 2500 MHz band:

^{30/} Siemens Comments at 33 (footnote omitted).

^{31/} Lucent Comments at 8.

^{32/} Motorola Comments at 20. Although Nokia Inc. (“Nokia”) supports a reallocation of the 2.5 GHz band (albeit without addressing the lack of availability of replacement spectrum that can support broadband wireless, relocation compensation issues, or the impact of retaking and reauctioning spectrum that has already been sold once), even it concedes that pairing spectrum at 2.5 GHz with spectrum at either 1.7 GHz or the 2110-2170 MHz band is flawed. *See* Comments of Nokia Inc., ET Docket No. 00-258, at 5-6 (filed Feb. 22, 2001) [hereinafter cited as “Nokia Comments”].

- (1) This sub-option would consume a large part of the mobile TX band of the 1800 MHz band (1710-1785 paired with 1805-1880 MHz). It is used in more than 60 countries for GSM 1800 today. Many countries will probably transform this spectrum to IMT-2000. This sub-option would prevent a cost-effective roaming between the US and such countries. Therefore this sub-option should not be adopted.
- (2) This option would cannibalize in addition the 2500-2690 MHz. It would prevent a cost effective roaming between the US and other countries. Therefore this sub-option should not be adopted.
- (3) Handset implementation, in particular handset antenna design could be difficult and expensive due to the larger duplex spacing (close to 400 MHz).^{33/}

And, AT&T notes that “it is unclear if such a plan ultimately will be adopted [anywhere else in the world]. As a result, adoption of this scheme would risk setting up a U.S.-only band plan, which plainly would not serve the best interests of domestic consumers, operators, and manufacturers.”^{34/}

Nor does the record support the reallocation of the 2.5 GHz band for stand-alone use.

AT&T notes, for example:

There are a number of serious disadvantages associated with [this approach], however, first and foremost of which is that it would not permit harmonization with existing European systems in the DCS 1800 band plan. Nor is it likely to be consistent with the plans that might be adopted by other countries in North and South America. In addition, propagation at this range is diminished compared to spectrum below 1850 MHz, which would necessitate the construction of additional sites to cover the same geographic area, thereby increasing 3G build-out costs. Moreover, this option would be inconsistent with most manufacturers’

^{33/} Siemens Comments at 34.

^{34/} AT&T Comments at 16.

plans, and potentially would require the development of complex handsets if pairing with other bands were permitted.^{35/}

Although there are still a few who call for reallocation of the 2.5 GHz band in the name of “global harmonization,”^{36/} the comments submitted by the mobile industry’s largest equipment suppliers debunk this argument. Lucent, for example, notes that:

The 2.5 GHz band is not currently in operation anywhere in the world for commercial mobile radio services. This band is sufficiently far from the PCS and DCS 1800 bands that it would impose greater challenges to support the operation of multi-band terminals. This allocation would also require significant changes in equipment to enable successful deployment of advanced wireless systems. Furthermore, while the EU has indicated that it may allocate 2.5 GHz for [3G] in the 2005-2010 timeframe, such allocations are not guaranteed to occur as projected and will be dependent upon business and market considerations. Thus, because use of this band at this time would not promote global roaming or create global economies of scale, Lucent believes that it would be premature to employ the 2.5 GHz band for advanced wireless services.^{37/}

In a similar vein, Motorola points out that “[a]lthough 2500-2690 MHz was identified by WRC-2000 as a potential IMT-2000 band, no country has yet implemented any commercial mobile services in this band and, in Motorola’s opinion, it is unlikely that any country will deploy IMT-2000 services before 2007 at the earliest. *Thus, the band does not offer the same near term potential for spectrum harmonization as does the 1710-1850 MHz band that is now widely*

^{35/} *Id.* at 16-17.

^{36/} See UWCC Comments at 4-5; Nokia Comments at 6; Verizon Comments at 30-31; Comments of Ericsson, Inc., ET Docket No. 00-258, at 3 (filed Feb. 22, 2001) [hereinafter cited as “Ericsson Comments”].

^{37/} Lucent Comments at 9; see also Nortel Comments at 11 (“While global roaming can most easily be achieved by common spectrum allocations worldwide, global harmonized spectrum allocations may be difficult to achieve. Different sets of incumbents in various countries could make it difficult to allocate an identical set of large blocks of spectrum for 3G services.”).

used globally for 2nd generation systems.”^{38/} Therefore, it comes as no surprise that mobile carriers themselves are now expressing ambivalence over whether global harmonization should be accorded high priority in this proceeding. For instance, Cook Inlet “cautions the Commission against focusing on promoting global harmonization at the expense of the prompt allocation and licensing of clear spectrum that is readily available for 3G services in the United States.”^{39/}

Cingular is even more emphatic:

[G]lobal harmonization is desirable but appears very difficult due to the mismatched allocations for 3G services. It is of paramount importance that the deployment of 3G technologies and services in the United States not be delayed or compromised for the purpose of pursuing rudimentary harmonization that ultimately may take years to happen. *Given its explosive growth, the wireless industry does not appear to have been harmed by missed economies of scale due to the current global mismatch of spectrum allocations.*^{40/}

Indeed, the comments submitted by the Radio Advisory Board of Canada confirm that a reallocation of the 2.5 GHz band will not promote even regional roaming: “In Canada, the 2500-2696 MHz band has been allocated to Multipoint Communications Systems/Multipoint Distribution Systems (MCS/MDS, similar to the ITFS/MMDS services that use the band in the

^{38/} Motorola Comments at 12 (emphasis added); *see also id.* at 19-20; AT&T Comments at 12-13 (noting that European countries appear “poised to launch [3G] services in this band in the 2008-2010 time frame”).

^{39/} Cook Inlet Comments at 5.

^{40/} Cingular Comments at 11-12 (emphasis added); *see also* Comments of The Telecommunications Industry Association, ET Docket No. 00-258, at 17 (filed Feb. 22, 2001) (pointing out that even spectrum *already allocated* for use by 3G systems cannot be harmonized, and, consequently, “global roaming and the associated economies of scale cannot be achieved in that spectrum”).

U.S.). The band is subject to constraints that are similar to those noted by the FCC in the Interim Report. . . .”^{41/}

The equipment manufacturers also confirm that global roaming will be accomplished through use of multi-band, multi-mode handsets, not through aligning all 3G spectrum allocations throughout the world. Conceding that “only a small percentage of. . . subscribers will ultimately have the need for global roaming capabilities,”^{42/} Qualcomm

concur with the Commission’s statement that “global roaming would be facilitated by having a single global band for 3G systems,” and that this is an unlikely outcome for the foreseeable future. Therefore regional and global roaming will only be possible through the use of multi-band handsets. Given that it is equally unlikely that all operators will use the same technology for the foreseeable future, it is also safe to say that regional and global roaming will also be dependent on the existence of multi-mode handsets. The development of multi-band, multi-mode equipment has been an expensive and lengthy process, which requires dedicated engineering resources. QUALCOMM believes that this situation is improving significantly with the introduction of new technologies that drive down cost and reduce complexity in multi-band, multi-mode handsets.^{43/}

The support within the wireless industry for allocation of the 1.7 GHz band for advanced wireless services, including 3G, is understandable. Indeed, such an allocation, combined with the large blocks of spectrum that are already available to mobile providers for 3G services and

^{41/} Comments of the Radio Advisory Board of Canada, ET Docket No. 00-258, at 11 (filed Feb. 22, 2001) [hereinafter cited as “RAB of Canada Comments”]. Indeed, the Radio Advisory Board of Canada also confirms that “[i]n Canada the band 2150-2160 MHz has been licensed to MCS/MDS operators” and will not be used for mobile services. *Id.* at 15.

^{42/} Qualcomm Comments at 12.

^{43/} Qualcomm Comments at 11 (footnote omitted); *see also NPRM* at ¶ 24 n.47 (observing that notwithstanding the absence of global harmonization, global roaming could be facilitated by multi-band phones). Moreover, as noted in WCA’s initial comments and the initial comments of The Software Defined Radio (“SDR”) Forum, the advent of software defined radio may soon moot this entire discussion. *See WCA Comments* at 61; *Comments of the SDR Forum, ET Docket No. 00-258, at 2* (filed Feb. 22, 2001).

potentially paired with an allocation of the 2110-2150 MHz band, provides the Commission with an opportunity to achieve exactly the sort of “win-win” solution for all parties that WCA has advocated all along in this proceeding.^{44/} That is, the mobile industry will have access to the spectrum it truly wants *and* the Commission will fully preserve the 2.1 and 2.5 GHz bands for MDS/ITFS wireless broadband service.

B. THE COMMENTS OF THE FEW WHO PROPOSE REALLOCATION OF THE MDS/ITFS BANDS ARE UNRESPONSIVE TO THE *NPRM* AND THUS PROVIDE THE COMMISSION WITH NO BASIS FOR RELOCATING MDS/ITFS OUT OF THE 2.1 AND 2.5 GHZ BANDS AND REAUCIONING THAT SPECTRUM FOR 3G.

It cannot be overemphasized that the Commission has explicitly recognized that MDS/ITFS wireless broadband service provides unique and substantial benefits to the public that are not being provided by traditional wireline technologies. Most important, the Commission has found that (1) “[t]he growth of [MDS/ITFS] two-way service is intended to provide affordable service to those market sectors that are more likely to be underserved and provide a competitive choice to consumers in more urban and more affluent markets,”^{45/} and (2) “in rural or otherwise underserved markets in the country, ITFS/MDS may be the sole provider of

^{44/} WCA Comments at 7. As recognized in the *NPRM*, “the ITU has identified for possible 3G systems several frequency bands, portions of which in the United States (approximately 210 MHz of spectrum) are already allocated or in use for Mobile and Fixed Services. The 806-960 MHz and the 1850-1910/1930-1990 MHz bands, which are currently used by cellular, SMR and broadband PCS services, may eventually be transitioned for use by advanced wireless systems.” *NPRM* at ¶ 34; *see also id.* at ¶ 50 (proposing allocation of the 2110-2150 MHz band for advanced wireless services). Also, the reauction of 40 MHz of broadband PCS Blocks C and F that was completed on January 26, 2001 makes it possible for other licensees to immediately put this spectrum to use for advanced wireless services. *See* WCA Comments at 55.

^{45/} “Interim Report - Spectrum Study of the 2500-2690 MHz Band: The Potential for Accommodating Third Generation Mobile Systems,” ET Docket No. 00-258, *FCC Staff Report*, at 57 (Nov. 15, 2000) [hereinafter cited as “*FCC Interim Report*”].

broadband service.”^{46/} Quite logically, then, the *NPRM* specifically cites the ongoing deployment of the 2.1 and 2.5 GHz bands for MDS/ITFS wireless broadband service, and asks commenting parties to address the impact reallocation of that spectrum for 3G and/or relocation of MDS/ITFS incumbents would have on the viability of that service.^{47/}

As noted above, WCA’s initial comments and those of numerous commercial operators and members of the ITFS community establish in considerable detail that reallocation of the 2.1 and 2.5 GHz bands and/or relocation of MDS/ITFS incumbents out of that spectrum would have immeasurable and unprecedented adverse technical, economic, legal and public policy consequences for MDS/ITFS operators, consumers, educators and their students.^{48/} State regulators, too, have weighed in on the debate. The Public Utility Commission of Texas has advised the Commission that:

Throughout the country, policymakers are struggling to identify techniques that will encourage the deployment of advanced and broadband services to customers in rural areas. One of the most promising distribution methods is the use of fixed wireless technology, such as Multichannel Multipoint Distribution Service (MMDS), in the provision of broadband services in rural areas. To the extent that the Commission’s spectrum decisions may hinder MMDS providers, for example, from extending such services to rural customers, the policy would conflict with the requirements of section 706 of the [Telecommunications Act of 1996].^{49/}

^{46/} *Id.* at 22.

^{47/} *See generally NPRM* at ¶¶ 60, 61-62 and 69.

^{48/} *See, e.g., WCA Comments* at 2-6.

^{49/} Comments of the Public Utility Commission of Texas, ET Docket No. 00-258, at 2 (filed Feb. 22, 2001); *see also* Cisco Comments at 4 (“[Cisco’s MDS platform] offers tremendous advantages and innovation over many other broadband service platforms. It delivers robust service that is comparable in speed and capacity with DSL and cable broadband platforms. As a wireless solution, it allows service providers to quickly deploy where there is no existing infrastructure. Yet Cisco’s fixed wireless solution is positioned to markedly extend the reach of broadband access: it presents a solid business case for serving small and rural markets because the capital expense and installation time required to deploy a network are so much lower.”).

And, ironically enough, the public interest benefits of the competition provided by fixed wireless broadband were reaffirmed very recently by President and co-Chief Executive Officer of Verizon Wireless (“Verizon”), Ivan Seidenberg:

Competition in broadband will consist of rival pathways to the home. Two such technologies already are available — cable modems and telephone digital subscriber lines. These will be joined in coming years by broadband fixed wireless and satellite connections. *The primary objective of federal policy makers should be to encourage new investment and allow competition between these rival “last-mile” technologies.*^{50/}

Nonetheless, the proponents of reallocating the 2.1 and 2.5 GHz bands have not provided the Commission with a substantive response to any of the public interest issues raised by the *NPRM* regarding displacement of MDS/ITFS incumbents. Most egregious is the fact that no advocate for reallocation takes account of the fact that MDS/ITFS-based wireless broadband system operators are using the 2.1 and 2.5 GHz bands for fixed wireless broadband service, nor do they even acknowledge the explicit findings in the *FCC Interim Report* as to the unique and substantial benefits that fixed wireless broadband service provides, or the consequences of disrupting or terminating that service to facilitate reallocation of the 2.1 and 2.5 GHz bands for 3G.^{51/}

^{50/} Seidenberg, “Stop Blocking the Broadband Revolution,” *WALL ST. J.*, Mar. 1, 2001, at A22 (emphasis added).

^{51/} Verizon makes the strange argument that if broadband system operators require more than the 80 MHz of spectrum that Verizon would leave with the MDS, “they can bid on it at auction.” Verizon Comments at 27. Verizon ignores, of course, that the spectrum has already been paid for once by the MDS BTA authorization holder (who acquired rights to ITFS, as well as MDS, channels). Moreover, Verizon’s suggestion borders on the disingenuous given Verizon’s acknowledgment that co-channel sharing of the band between 3G and MDS is not possible and that “[t]he simultaneous use of these frequencies by mobile and fixed services would require substantial separation distances that would impede the nationwide deployment of 3G services.” *Id.* at 19. Since there is no dispute that broadband

For similar reasons, Verizon's attack on MDS/ITFS leasing arrangements in the 2.5 GHz band fails entirely. Boiled to its essence, Verizon's argument here is that ITFS licensees should lose 60 MHz of spectrum at 2.5 GHz because they are leasing a substantial portion of their spectrum for commercial purposes.^{52/} Certainly, the fact that ITFS licensees lease a substantial portion of their spectrum for commercial use should come as no surprise to the Commission – indeed, Verizon itself cites a long line of decisions in which the Commission has modified its rules to encourage the very leasing arrangements Verizon now complains of.^{53/} More fundamentally, however, Verizon's attack on ITFS leasing must be rejected because it completely ignores the public interest benefits of what ITFS spectrum at 2.5 GHz is leased for – the provision of much-needed wireless broadband services to residential, commercial and educational users. As recognized in the *FCC Interim Report* and demonstrated by the initial comments of WCA, Sprint, WorldCom, Nucentrix, NIA, Catholic Television Network and others, the MDS/ITFS partnership created by ITFS leasing arrangements is an indispensable component of commercial wireless broadband service.^{54/} Yet nowhere does Verizon's grab for

wireless and 3G cannot co-exist in the same band, affording broadband operators the opportunity to bid for useless spectrum hardly advances the ball.

^{52/} *Id.* at 21-24.

^{53/} *Id.*

^{54/} See, e.g., *FCC Interim Report* at 60; *Amendment of Parts 21 and 74 to Enable Multipoint Distribution Service and Instructional Television Fixed Service Licensees to Engage in Two-Way Fixed Transmissions*, 13 FCC Rcd 19112, 19148 (1998) (“An MDS operator trying to run a system across its [Basic Trading Area] must cooperate with the various ITFS licensees in its BTA. Likewise, many ITFS licensees depend on the compensation paid by their local MDS operator to make their own systems a reality. Therefore, the viability of the services depends on the parties working together in good faith. . .”) [hereinafter cited as “*Two-Way Report and Order*”]; *Amendment of Part 74 of the Commission's Rules Governing Use of the Frequencies in the Instructional Television Fixed Service*, 9 FCC Rcd 3360, 3364 (1994) (“In today's market environment, MMDS channels and ITFS channels

ITFS spectrum account for this fact, or for the demonstrable harm to consumers that would ensue from disruption of ITFS leasing arrangements caused by reallocation of the 2.5 GHz band. Nor does Verizon even acknowledge, much less address, the harm that educators and their students would suffer were ITFS licensees to lose the critical financial and technical support made possible by lease revenue from commercial operators.^{55/}

Moreover, it is impossible to reconcile Verizon's attack on ITFS leasing with the Commission's "secondary markets" policy. The Commission expects that an active leasing market "will facilitate full utilization of spectrum by the highest value end users,"^{56/} and "make more spectrum available for existing services that are spectrum-constrained, while ensuring that the needs of the public are served."^{57/} Obviously, none of the benefits of secondary markets for spectrum are achievable if the Commission punishes ITFS licensees for engaging in the very same sort of leasing transactions that the secondary markets policy is designed to promote.

are interrelated components of an integrated set of channels used to provide non-broadcast instructional and entertainment programming in a given market.").

^{55/} See, e.g., *Amendment of Part 74 of the Commission's Rules Governing Use of the Frequencies in the Instructional Television Fixed Service*, 9 FCC Rcd 3360, 3364 (1994) ("Before the Commission permitted leasing of excess capacity, the spectrum initially allotted for ITFS was so underutilized outside metropolitan areas that the Commission reallocated two entire ITFS channel groups, or eight channels, to MMDS. With the advent of leasing, demand for ITFS channels has surged. Leasing has prompted revenue-sharing arrangements between ITFS licensees and wireless cable operators, resulting not only in full use of the spectrum, but in full realization by educators of what was once only an unattainable aspiration: to become actively engaged in a technology that exposes their students to educational and interactive instructional programming previously inaccessible to them.").

^{56/} *Principles for Reallocation of Spectrum to Encourage the Development of Telecommunications Technologies for the New Millennium*, 14 FCC Rcd 19868, 19872 (1999).

^{57/} *Id.* at 19876; see also Comments of Cellular Telecommunications & Internet Association, ET Docket No 00-258, at 7-8 (filed Feb. 22, 2001) (supporting "voluntary secondary market arrangements" as a means of providing additional spectrum for 3G) [hereinafter cited as "CTIA Comments"].

The filings of the handful of commenters who advocate segmenting a portion of the 2.5 GHz band are utterly barren of any engineering and/or economic data demonstrating that reallocation can be accomplished without a crippling impact on the ongoing deployment of MDS/ITFS-based wireless broadband service. Cingular's comments are illustrative: with no supporting evidence whatsoever, Cingular asserts that the Commission could reallocate as much as *120 MHz* out of the 2.5 GHz band, and that the remaining 70 MHz of spectrum would be sufficient to support MDS/ITFS wireless broadband service.^{58/} Not to be outdone, Ericsson, Inc. ("Ericsson") suggests that *all* of the 2.1 and 2.5 GHz bands could be reallocated for 3G, with no discussion of how MDS/ITFS operators can be expected to operate a commercially viable wireless broadband service without *any* spectrum.^{59/} These filings must be contrasted with the HAI Consulting, Inc. study submitted by WCA and other detailed evidence submitted by the MDS/ITFS community establishing that any reduction in the amount of spectrum allocated to MDS or ITFS would be a body blow to the future of broadband wireless.^{60/}

It also comes as no surprise that the proponents of reallocation devote no attention to the serious legal and public policy implications of reauctioning spectrum in the 2.1 and 2.5 GHz bands that was bought and paid for at the Commission's 1996 nationwide auction of MDS Basic Trading Area ("BTA") authorizations.^{61/} Likewise, for all their talk about the need to relocate

^{58/} Cingular Comments at 24.

^{59/} Ericsson Comments at 15-17.

^{60/} See WCA Comments at Appendix B; Cisco Comments at 6-13.

^{61/} As noted in the *FCC Interim Report* and in WCA's initial comments, BTA auction winners did not merely secure rights to the traditional MDS channels (channels 1 and 2/2A in the 2.1 GHz band and channels E1-E4, F1-F4 and H1-H3 in the 2.5 GHz band). See, e.g., WCA Comments at 45. An MDS

MDS/ITFS incumbents out of the 2.1 and 2.5 GHz bands, the proponents of reallocation fail to identify any specific comparable replacement spectrum to which MDS/ITFS incumbents could be relocated. For example, while Verizon argues that ITFS services “can be accommodated in frequency bands above 3 GHz that are well suited for fixed services but cannot support mobility,” it never identifies what spectrum above 3 GHz it is talking about or how ITFS incumbents could be accommodated there.^{62/} Telephone and Data Systems, Inc. (“TDS”) is equally cryptic, merely suggesting that MDS/ITFS incumbents in the 2.5 GHz band “could presumably operate in higher frequency bands.”^{63/} Similarly, in a single sentence buried in a footnote, Ericsson states that MDS/ITFS incumbents at 2.5 GHz “could be transitioned to 3.5 GHz” but provides no specific identification of the spectrum it is proposing for reallocation, much less demonstrate that it is available and would be comparable.^{64/} Most important, *none of Verizon,*

BTA authorization holder also purchased the sole right to construct and operate commercial stations on up to eight available ITFS channels within its BTA. *Id.* Moreover, BTA auction winners secured the rights to use the available MDS and ITFS channels in a flexible manner, subject only to compliance with or waiver of the Commission’s technical rules. *Id.* at 45-46.

^{62/} See Verizon Comments at 26. Cingular suggests that “commercial fixed links” in the 2160-2165 MHz band could be relocated to the 4 GHz, 6 GHz, 10 GHz and 11 GHz bands, but appears to have overlooked the fact that the 2160-2165 MHz band is also occupied by incumbent MDS licensees operating at 2160-2162 MHz, *i.e.*, the upper two megahertz of MDS channel 2. Cingular Comments at 23. Aside from the fact that neither Cingular nor any other mobile carrier has specifically identified any comparable replacement spectrum for MDS incumbents above 3 GHz, it is patently obvious that forcing a Balkanization of MDS channel 2 into two bands will impose extraordinary costs for equipment and delay the launching of new services using MDS channel 2 -- all to the detriment of the Commission’s effort to promote broadband deployment. See WCA Comments at 44 n.114.

^{63/} TDS Comments at 10 n.10. VoiceStream Wireless Corp. (“VoiceStream”) does not even attempt to identify relocation spectrum as requested by the *NPRM*; instead VoiceStream punts the ball back to the Commission “to review the current uses of the 2500-2690 MHz band and identify alternative spectrum to accommodate incumbent systems.” Comments of VoiceStream Wireless Corp., ET Docket No. 00-258, at 2 (filed Feb. 22, 2001).

^{64/} Ericsson Comments at 16 n.33.

TDS, Ericsson, or any other representative of the mobile industry provide any technical refutation of the Commission's prior determination that "there are no frequency allocations above 3 GHz that could readily support the requirements of MDS, which are wide-area and point-to-multipoint in nature."^{65/}

The proponents of reallocation fare even worse on the issue of relocation procedures and reimbursement of the MDS/ITFS industry's relocation costs. The *NPRM* very specifically requested comment on whether the Commission should apply its relocation procedures for fixed microwave incumbents at 2165-2200 and 2110-2115 MHz to relocation of MDS/ITFS incumbents.^{66/} Here again, however, the advocates of reallocation brush the *NPRM* aside and leave the Commission to fend for itself. For instance, Cingular's "analysis" of the problem is limited to its unremarkable observation that relocation of MDS/ITFS incumbents to other spectrum "may not be easy."^{67/} Verizon only asserts that "the need to relocate incumbents is not a bar to reallocating spectrum," and that relocation "is often the inevitable result of the reallocation process";^{68/} it makes no attempt to address the Commission's more fundamental inquiry as to whether the agency's relocation procedures can even be sensibly applied to MDS and ITFS incumbents in the 2.1 and 2.5 GHz band, and how if at all those procedures would provide reimbursement for the unprecedented relocation costs associated with relocating the

^{65/} WCA Comments at 31, quoting *Redevelopment of Spectrum to Encourage Innovation in the Use of New Telecommunications Technologies*, 7 FCC Rcd 6886, 6889 (1992) (emphasis added).

^{66/} *NPRM* at ¶ 64.

^{67/} Cingular Comments at 25.

^{68/} Verizon Comments at 26.

mass market, highly complex fixed wireless broadband service that MDS/ITFS operators provide to the public. Likewise, TDS merely asserts the obvious – that MDS/ITFS incumbents “will suffer no detriment” if they “are compensated and receive reasonably comparable facilities on workable frequency bands” – but says nothing about how it proposes to accomplish this.^{69/} AT&T’s failure to address the implications of relocation to higher spectrum is particularly noteworthy, since AT&T specifically recognizes that as one moves to higher spectrum with inferior propagation characteristics, one must incur additional expenses to deploy and operate more cells in order to achieve comparable coverage.^{70/}

In fact, as set forth at pages 50-52 of WCA’s initial comments, the issues associated with relocating MDS/ITFS incumbents are hardly as inconsequential as the proponents of reallocation would like the Commission to believe:

- C A relocation of MDS/ITFS would represent the first time that the Commission would be relocating a service in which licensees routinely lease capacity to system operators who invest substantial sums in reliance on the availability of that capacity. Because lessees may choose not to lease the relocation spectrum to which MDS/ITFS licensees are moved, the Commission must assure that those licensees are fully compensated for leasing revenue lost as a result of the relocation.

- C MDS/ITFS would be the first relocated service that is used to provide service directly to consumers on a mass-market basis. Since relocation is unlikely to commence for several years (as it is unlikely that relocation would be to spectrum which is clear or for which equipment is readily available),^{71/} in the interim, some system operators may continue to deploy facilities across the United States and

^{69/} TDS Comments at 10.

^{70/} See AT&T Comments at 17.

^{71/} The HAI Study concludes that “manufacturing lead times required to redesign and produce equipment in new bands may reasonably be expected to be two to three years.” WCA Comments, Appendix B at 9.

sign up broadband customers at a very aggressive pace (others may choose to delay deployment). Operators who do venture ahead will incur extraordinary expenses to notify potentially millions of subscribers that their customer premises equipment must be replaced, to schedule appointments for such replacement, and to then supervise and successfully complete potentially millions of truck rolls and equipment change-outs.

- C Compensation for subscribers lost to cable modem or DSL providers during the relocation process will have to be provided to system operators and to MDS/ITFS licensees (who generally receive lease fees based either on the number of subscribers to the system or on the revenue of the system). In addition, compensation will have to be provided for those subscribers who resist the effort to change-out equipment and cannot be served as a result.
- C Customer premises equipment generally will be more expensive than the CPE that would have been required had MDS/ITFS remained at its current allocation because of the requirement to operate at higher frequencies and because manufacturers will not have had time to develop cost-effective second generation equipment or to capture economies of scale.^{72/} Provisions will have to be made to reimburse those ongoing increased costs.
- C Since the submission of its initial comments, WCA has learned that at least one MDS/ITFS operator is already selling CPE directly to customers at retail.^{73/} As a result, the Commission's relocation policy will need to be expanded to assure that consumers who have purchased customer premises equipment are made whole.
- C An MDS/ITFS system (whether a broadband system or a video system) is comprised of facilities licensed to multiple licensees operating on multiple channels. Historically, the Commission has utilized a "selective relocation" policy under which the newcomer was free to pick and choose the facilities it would relocate (so long as no interference was caused).^{74/} Such a policy could be

^{72/} See *id.* ("Beyond about 3 GHz, equipment designers are forced to different technologies and lower integrated circuit device densities for radio frequency parts, which profoundly increases manufacturing cost and equipment prices."); Cisco Comments at 9-11.

^{73/} See *Sprint Launches First Broadband Wireless Market in Phoenix*, Sprint Press Release (May 8, 2000), at http://www3.sprint.com/PR/CDA/PR_CDA_Press_Releases_Detail/1,1694,814,00.html (last visited Mar. 6, 2001).

^{74/} See *Amendment to Commission's Rules Regarding a Plan for Sharing the Costs of Microwave Relocation*, 11 FCC Rcd 8825, 8845 (1996) [hereinafter cited as "*Microwave Cost-Sharing Order*"]; see

disastrous here, as it threatens to Balkanize MDS/ITFS deployment into multiple bands that would vary from market to market.^{25/} The proponent of relocation must be required to relocate all facilities, or none (absent an agreement by the system operator to the contrary).

- C Relocation is certain to impose upon MDS/ITFS system designers the need to utilize additional cells in order to provide comparable coverage to a comparable number of subscribers. In addition to the additional equipment, operational and maintenance expenses that will be incurred (and that would have to be fully reimbursed), it will be necessary for the party forcing the relocation to provide fiber or microwave backhaul facilities that have not heretofore been required by the circumstances presented by prior relocations.

Finally, it must be emphasized that relocating MDS/ITFS incumbents out of the 2.1 and 2.5 GHz bands has marketplace implications well beyond the present debate over 3G. The mobile carriers who most aggressively support relocation (*e.g.*, TDS, Cingular and Verizon) are affiliated with wireline cable broadband and DSL services that face competition from MDS/ITFS wireless broadband service. As alluded to in Mr. Seidenberg's above-quoted statement, that competition and the benefits it provides to consumers are precisely what is at stake in this proceeding.

In sum, the handful of proponents of taking the 2.1 and 2.5 GHz bands have done precisely what the *NPRM* encouraged commenting parties *not* to do, *i.e.*, evaluate the spectrum allocation issue solely through the prism of 3G, without regard to the Commission's broader statutory mandate to promote the deployment of *all* advanced wireless services, mobile *and*

also 47 C.F.R. § 101.75(a).

^{25/} Indeed, the Commission adopted its "selective relocation" policy because, among other things, many point-to-point microwave incumbents were already operating networks that consisted of both 2 GHz and 6 GHz links, and thus were already equipped for operation on relocation spectrum. *Microwave Cost-Sharing Order*, 11 FCC Rcd at 8845. Obviously, that assumption cannot be made with respect to MDS/ITFS incumbents.

fixed.^{76/} When one considers the substantial public interest benefits of retaining the 2.1 and 2.5 GHz bands for MDS/ITFS-based wireless broadband services, combined with the mobile industry's strong preference for the 1.7 GHz band and the fact that reallocating the 2.5 GHz band for 3G will not promote global roaming or harmonization, the case against reallocation of the MDS/ITFS spectrum becomes overwhelming.

C. MDS AT 2.1 GHZ AND 3G CAN CO-EXIST IN NEARBY BANDS IF THE COMMISSION ADOPTS REASONABLE TECHNICAL RULES.

WCA fully agrees with CTIA that:

It is a primary function of the Commission to ensure that licensees and their subscribers are not subject to interference. . . . [T]he Commission must also retain necessary restrictions to guard against interference problems and interservice sharing problems. While flexible spectrum policies allow carriers to put spectrum to its best and highest use, continued application of the Commission's rules governing harmful interference is necessary to ensure the viability of that spectrum. Such restrictions serve important public interests, and will minimize post-licensing interference problems that can be costly and complicated to resolve.^{77/}

^{76/} See *NPRM* at ¶ 1 (“In this *Notice of Proposed Rule Making*, we explore the possible use of frequency bands below 3 GHz to support the introduction of new advanced wireless services, including third generation (“3G”) as well as future generations of wireless systems. Advanced wireless systems could provide, for example, a wide range of voice, data and broadband services over a variety of mobile and fixed networks. Specifically, we explore the possibility of introducing new advanced mobile and fixed services in frequency bands currently used for cellular, broadband Personal Communications Service (“PCS”), and Specialized Mobile Radio (“SMR”) services, as well as in five other frequency bands: 1710-1755 MHz, 1755-1850 MHz, 2110-2150 MHz, 2160-2165 MHz and 2500-2690 MHz. By these actions, we initiate proceedings to provide for the introduction of new advanced wireless services to the public, consistent with our obligations under section 706 of the 1996 Telecommunications Act, and promote increased competition among terrestrial services.”) (footnote omitted).

^{77/} CTIA Comments at 11-12.

Indeed, WCA raised very similar concerns in its comments in response to the *Third Notice of Proposed Rule Making* in ET Docket No. 95-18, in which the Commission proposed reallocation of the 2110-2150 MHz band for fixed and mobile usage.^{78/}

WCA appreciates that, as a practical matter, a modest guardband will be required between any spectrum allocated for 3G and the 2.1 GHz spectrum already allocated to MDS, just as guardbands will apparently be needed between 3G and 2G.^{79/} However, the Commission should note that Verizon substantially overstates the nature of the issue when it makes the *in terrorem* assertion that “continued operation of MDS in the 2150-2160 MHz band could preclude the use of the entire 2110-2150 MHz and 2160-2165 MHz bands for future 3G use.”^{80/} Verizon’s objective is transparent – to divest the MDS/ITFS-based broadband industry of spectrum that is essential to providing competition to Verizon’s own DSL service.^{81/} A review of the facts

^{78/} Comments of The Wireless Communications Association International, Inc., ET Docket No. 95-18, at 2 (filed Feb. 3, 1999) (urging that the rules adopted for 2110-2150 MHz “fully protect the continued ability of MDS and ITFS licensees in the adjacent 2150-2162 MHz band to deploy broadband services free of interference.”) [hereinafter cited as “WCA 2110-2150 MHz Comments”].

^{79/} See Motorola Comments at 20-22.

^{80/} Verizon Comments at 14 (emphasis in original).

^{81/} While Verizon suggests that “[o]ne option might be to move these systems to spectrum within or adjacent to the current MDS allocations at 2500-2690 MHz,” it fails to identify any specific spectrum. See *id.* at 15. Of course, moving MDS channels 1 and 2/2A to the 2.5 GHz band, presumably by displacing ITFS (as the *FCC Interim Report* acknowledges, there is little unlicensed spectrum in the 2.5 GHz band) does not make broadband wireless providers whole, as the ITFS channels being displaced are likely required for the provision of the broadband service. And, to the best of WCA’s knowledge, the spectrum immediately adjacent to the 2.5 GHz band is not readily available for reallocation. Moreover, Verizon ignores the fact that MDS channels 1 and 2/2A are frequently paired with spectrum at 2.5 GHz and that relocation of those channels to the 2.5 GHz band might result in inadequate duplex spacing. See WCA Comments at 35-36. Thus, Verizon’s proposal would necessarily reduce the spectrum available for MDS/ITFS-based broadband service and, in many markets, could deprive the broadband operator of the critical mass of channels necessary to compete. See *id.* at 32-33.

demonstrates, however, that 3G and 2.1 GHz MDS can co-exist with only a relatively modest guardband between them.

In order to provide a more accurate assessment of the potential for co-existence, WCA retained George Harter of MSI to prepare a report on the issue. A copy of that report, "Adjacent Band Interference Issues Between MDS at 2.1 GHz and 3G," is annexed as Appendix A. Mr. Harter concludes that the Verizon analysis is fundamentally flawed by its failure to consider elevation angles between MDS base stations and mobile 3G units, and by the unrealistic assumption that downstream MDS stations would operate with attenuation of 60 dB at all frequencies more than 3 MHz from the channel edge, no matter how far removed. Admittedly, the Commission's spectral mask for downstream MDS stations operating at 2.1 GHz (which was adopted in 1999 after a two and a half year proceeding in which neither Verizon nor any mobile interest participated)^{82/} does not require greater attenuation than that assumed by Verizon. However, as Mr. Harter notes, in actuality the out-of-band emissions will not stay constant at 60 dB down from 3 MHz from the MDS channel edge to infinity. Instead, there is an inevitable additional roll-off that reduces the level of out-of-band emissions as frequencies become further removed from the channel edge.

Because downstream out-of-band emissions are, in fact, attenuated by more than 60 dB more than 3 MHz from the channel edge, WCA would not oppose the adoption of a revised downstream spectral mask for 2.1 GHz MDS base stations that reflects the manner in which 2.1

^{82/} See *Two-Way Report and Order; Amendment of Parts 1, 21 and 74 to Enable Multipoint Distribution Service and Instructional Television Fixed Service Licensees to Engage in Fixed Two-Way Transmissions; Request for Declaratory Ruling on the Use of Digital Modulation by Multipoint Distribution Service and Instructional Television Fixed Service Stations*, 14 FCC Rcd 12764 (1999).

GHz equipment actually performs, so long as the Commission also adopts the proposals set forth in the following paragraph to protect 2.1 GHz MDS from interference by 3G base stations. Specifically, WCA proposes that Sections 21.908(a) and (b)(1) of the Commission's rules, which establish the MDS downstream spectral masks applicable to the 2.1 GHz band, be revised as set forth in Appendix B. Those revisions would require that out-of-band emissions be attenuated 67 dB at 5 MHz from the MDS downstream channel edge, and 80 dB at 10 MHz or more from the MDS downstream channel edge. Since this reflects the current state of 2.1 GHz MDS downstream technology, it is clear that the vast majority of the 2110-2150 MHz band can today be utilized by 3G without suffering the 7 dB increase in the 3G receiver noise floor that Verizon complains of.^{83/}

Verizon's comments represent a myopic view of the issue – Verizon concerns itself solely with the potential for interference from MDS to 3G and ignores the equally important issue of interference from 3G to MDS. Ironically, while Verizon attacks the MDS spectral mask, that mask is more stringent than the mask under which PCS currently operates. Although further engineering analysis is required to identify precisely the size of the guardband required to protect MDS use of the 2.1 GHz band from interference by 3G operations, preliminary analysis suggests that by imposing an appropriate 3G spectral mask, limiting 3G power levels to those set out in the February 21, 2001 Report of the Industry Working Group on 3G Characteristics submitted as an attachment to the Mobile Industry Association Comments, and implementing a modest

^{83/} Even without considering the effect of elevation angles discussed by Mr. Harter, 3G operations 5 MHz or more from the 2.1 GHz MDS downstream channel edge would not suffer any increase in the noise floor.

guardband, the Commission can provide for co-existence between 3G and 2.1 GHz MDS in nearby bands. WCA expects to submit a supplemental engineering analysis of this issue shortly.

D. THE PROPOSAL TO RELOCATE MDS CHANNELS 1 AND 2/2A TO 2155-2165 MHz IS FLAWED.

Virtually all of those from the mobile industry commenting on the matter recognize that MDS channels 1 and 2/2A should not be reallocated away from the wireless broadband industry.^{84/} However, some have suggested that the channels be moved to 2155-2165 MHz so the Commission can combine the 2110-2150 MHz and 2160-2165 MHz bands into a single contiguous band that would be available for 3G usage.^{85/} While this approach may have some surface attraction at first blush, on closer inspection its flaws become evident.

^{84/} See Motorola Comments at 17; AT&T Comments at 9 (“the 2110-2150 MHz and 2160-2165 MHz bands should be designated for emerging technologies.”); Siemens Comments at 29 (“Siemens proposes to the FCC to allocate the bands 2110-2150 MHz and 2160-2165 MHz for New Advanced Wireless Services.”); Cingular Comments at 23 (“Cingular believes that the 2110-2150 MHz and 2160-2165 MHz bands should be reallocated for advanced fixed and mobile services.”). Two foreign vendors, Nokia and Ericsson, depart from the U.S. mobile industry, arguing that the entire 2110-2170 MHz should be reallocated for 3G services. See Nokia Comments at 3-4; Ericsson Comments at 17. However, both fail to address the myriad of issues raised by WCA and others regarding reallocation of the 2.1 GHz band. See, e.g., WCA Comments at 22-25, 38-40, 48-53; WorldCom Comments at 10-16, 21-23; Sprint Comments at 25, 26-28. For example, neither addresses the fact that, absent MDS channels 1 and 2/2A, many MDS/ITFS-based wireless broadband systems will lack the channel capacity needed to provide an economically viable service. See WCA Comments at 38-40 and Appendix B, Nucentrix Comments at 20, IPWireless Comments at 12-13. As Cisco correctly notes, the 2.1 GHz band “now is essential to facilitate the transition from video to complete broadband services.” Cisco Comments at 8. And, while Nokia claims that reallocating the 2110-2170 MHz band will promote regional roaming under a proposal advanced by a handful of Central and South American countries, see Nokia Comments at 3, it ignores the fact that Canada has allocated the 2150-2160 MHz band for fixed wireless upstream communications and has rejected calls for the use of that band for mobile applications. See RAB of Canada Comments at 15.

^{85/} See AT&T Comments at 12 (“AT&T proposes that the Commission designate 2150-2155 MHz for fixed and mobile services and redesignate the 2155-2165 MHz segment for MDS licensees currently operating in the 2150-2160 MHz band.”); Motorola Comments at 17 (“Motorola believes it would be technically beneficial for both the 3G/IMT-2000 and MDS services if the 3G allocation in the 2110-2150/2160-2165 MHz band were consolidated.”); Verizon Comments at 15.

At the outset, the proposal to move the 2.1 GHz MDS allocation to the 2155-2165 MHz band ignores the fact that in fifty major markets, MDS channels 1 and 2 occupy not just 2150-2160 MHz, but the twelve megahertz at 2150-2162 MHz. As WCA noted in its initial comments, the Commission has previously committed to protect the use of the 2160-2162 MHz sub-band by MDS licensees who had applied for their use of that spectrum prior to January 16, 1992.^{86/} Thus, were the Commission to move the MDS channel 1 and 2 allocation in order to provide a contiguous band for 3G, the Commission would have to provide a full 12 MHz of spectrum for MDS, not just 10 MHz. That would require moving MDS channels 1 and 2/2A to the 2153-2165 MHz band, or taking spectrum from the financially-troubled Mobile Satellite Service (“MSS”), to which the 2165-2200 MHz band has been allocated but for which the Commission has yet to issue any licenses.

Next, the proposal to relocate MDS channels 1 and 2/2A to 2155-2165 MHz fails to consider that such a relocation will eliminate the *de facto* guardband between MDS channel 2/2A and the MSS, which has been allocated downlink spectrum at 2165-2200 MHz. WCA has pending before the Commission a petition for reconsideration of the *Report and Order* in IB Docket No. 99-81, in which WCA has demonstrated that operations in the 2150-2162 MHz band will be subject to interference from MSS and therefore it is necessary for the Commission to revise the MSS spectral mask to limit aggregate MSS power flux density in the 2150-2162 MHz band at the earth’s surface to -172 dBW/m² using a 4 kHz resolution bandwidth.^{87/} If the

^{86/} See WCA Comments at 44, citing *Redevelopment of Spectrum to Encourage Innovation In The Use of New Telecommunications Technologies*, 7 FCC Rcd 6886, 6890 (1992).

^{87/} See Petition of The Wireless Communications Association International, Inc. for Reconsideration, IB Docket No. 99-81 (filed Nov. 3, 2000). Thus, Motorola is incorrect in asserting that “it would be

guardband between MSS and MDS were reduced or eliminated, MSS would have to either utilize more sophisticated filtering in its downlink transmitters or devote a portion of the MSS spectrum as a guardband in order to meet the proposed mask. WCA is ambivalent as to which approach the Commission and the MSS industry take – so long as MDS channel 1 and 2/2A licensees are assured that aggregate power flux density caused by out-of-band MSS emissions in the 2150-2162 MHz band at the earth's surface is limited to -172 dBW/m² using a 4 kHz resolution bandwidth. WCA's point is merely that elimination of the existing guardband would adversely impact MSS.

In addition, the prospect of relocating subscribers from 2150-2162 MHz to 2153-2165 MHz or slightly higher raises a host of transitional issues that will have to be explored in great detail. It is absolutely essential that any transitional plan provide for a seamless conversion without any disruption of service to consumers. Effectuating such a conversion may prove problematic.^{88/}

Finally, although none of the proponents of moving MDS channels 1 and 2 to the 2155-2165 MHz band address relocation issues, there will be material costs associated with such a move that would have to be reimbursed before relocation occurs. Current 2.1 GHz MDS

technically beneficial for both the 3G/IMT-2000 and MDS services if the 3G allocation in the 2110-2150/2160-2165 MHz band were consolidated.” Motorola Comments at 17. While such consolidation would no doubt aid 3G, it would prove highly detrimental to the interests of MDS licensees (including those who purchased their rights to MDS channels 1 and 2/2A at auction).

^{88/} Specifically, WCA is concerned that because of the overlap between the new and the old bands, a broadband service provider might not be able to operate simultaneously in both bands for a transitional period during which customer premises equipment would be swapped-out. This issue requires further examination before the Commission can fully assess the costs and disruption that would be caused to the MDS/ITFS-based wireless broadband industry by a forced relocation of MDS channels 1 and 2/2A.

transmission equipment cannot readily be tuned to the new frequencies and most will have to be replaced.^{89/} This would be a costly and disruptive process. As WCA noted in its initial comments:

Operators will incur extraordinary expenses to notify potentially millions of subscribers that their customer premises equipment must be replaced, to schedule appointments for such replacement, and to then supervise and successfully complete potentially millions of truck rolls and equipment change-outs. In addition to the costs associated with acquiring new customer premises equipment to replace existing equipment (which obviously must be reimbursed), operators will incur huge expenses in connection with the diversion of their own personnel from the task of marketing and installing new subscribers to the task of relocation.^{90/}

III. CONCLUSION.

In sum, the *NPRM* properly recognizes that this proceeding cannot merely be about finding additional spectrum for mobile 3G use, but must address the public interest benefits of preserving the MDS/ITFS-based wireless broadband service. As set forth in the comments submitted by WCA, commercial MDS operators and the ITFS community, the marginal benefits (if any) of clearing the 2.1 and 2.5 GHz bands for 3G are small when weighed against the crippling impact any forced relocation of MDS and/or ITFS licensees to other bands would have on the deployment of MDS/ITFS wireless broadband service to residential and educational users in unserved and underserved areas. Moreover, any retaking and reauctioning of the 2.1 and 2.5 GHz bands for the benefit of 3G would raise unprecedented legal and public policy issues and

^{89/} While the subscriber premises transmission equipment will have to be replaced if MDS channels 1 and 2/2A are relocated to even slightly higher frequencies, it is possible that some of the transmission equipment located at the base station could be modified (albeit at substantial cost) to operate at slightly higher frequencies.

^{90/} WCA Comments at 50.

have a substantial and irrevocable chilling effect on spectrum auctions for years to come. The unresponsive filings by the handful of proponents of reallocating the MDS/ITFS bands reinforce these points. Accordingly, for the reasons set forth above and in its initial comments, WCA calls upon the Commission in its *Final Report* to immediately declare that it will not reallocate the 2.1 and 2.5 GHz bands, thereby removing the cloud of regulatory uncertainty created by this proceeding.

Respectfully submitted,

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APPENDIX A

Adjacent Band Interference Issues Between MDS at 2.1 GHz and 3G

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MSI

Introduction

In response to the Commission's NPRM in ET Docket No. 00-259 on spectrum allocation for 3G services comments were filed asserting that adjacent band interference from existing MDS operations at 2150-2162 MHz would effectively preclude any use of the 2110 - 2150 MHz band for 3G services. MSI has been retained by the Wireless Communications Association International, Inc. to provide a technical analysis of this argument.

As will be demonstrated below, the assertion that 3G would be precluded from any use of the 2110-2150 MHz band if MDS remains in the 2.1 GHz band is overly pessimistic, as it does not reflect accurately the out-of-band emissions performance of MDS downstream transmitters in the 2150-2162 MHz band. In fact, 3G services will be able to co-exist with MDS if the Commission adopts a modest guardband, tightens the MDS downstream spectral mask for the 2150-2162 MHz band, imposes appropriate out-of-band (OOB) emissions restrictions on 3G and limits 3G transmissions to those maximum power levels being contemplated by the mobile industry.

Interference to 3G from MDS

Verizon Wireless submitted comments with regards to the potential for adjacent channel interference to 3G mobile units from MDS downstream transmissions in the 2150-2162 MHz band, and concluded that such interference would effectively preclude any use of the 2110-2150 MHz band for 3G. Verizon's analysis calculated the potential increase in the noise floor to a 3G mobile unit using the existing FCC spectral mask. While we agree that protecting the noise floor from interference is exactly the correct requirement and should be applied to both 3G and MDS receivers, we disagree with certain of the assumptions underlying Verizon's analysis. These incorrect assumptions regarding the operation of MDS systems have led Verizon to exaggerate the interference potential.

First, the probability of an MDS base station being both within 0.5 kms of a 3G mobile unit and being at the same height is extremely low. There are elevational pattern characteristics of the MDS transmit antenna that will severely reduce the received signal level present at a 3G mobile within 0.5 kms of a 3G mobile receiver (which will usually be located near the ground). Typical MDS

base station antenna heights will range between 150' and 500' AGL depending on whether a supercell or cellular architecture is involved.

If we conduct the same analysis as Verizon but introduce an MDS base station located at heights between 150' and 500' AGL, a 3G mobile unit at 6' AGL and utilize elevational pattern characteristics of existing MDS antennas, the interference levels are significantly reduced. Attached as Figure 1 is a chart showing the receive signal level calculations for three different MDS transmit antennas at 150' and 300' AGL for distances out to 1.6 kms. The elevational patterns plotted represent an estimated 95% of the MDS downstream antennas in operation today.

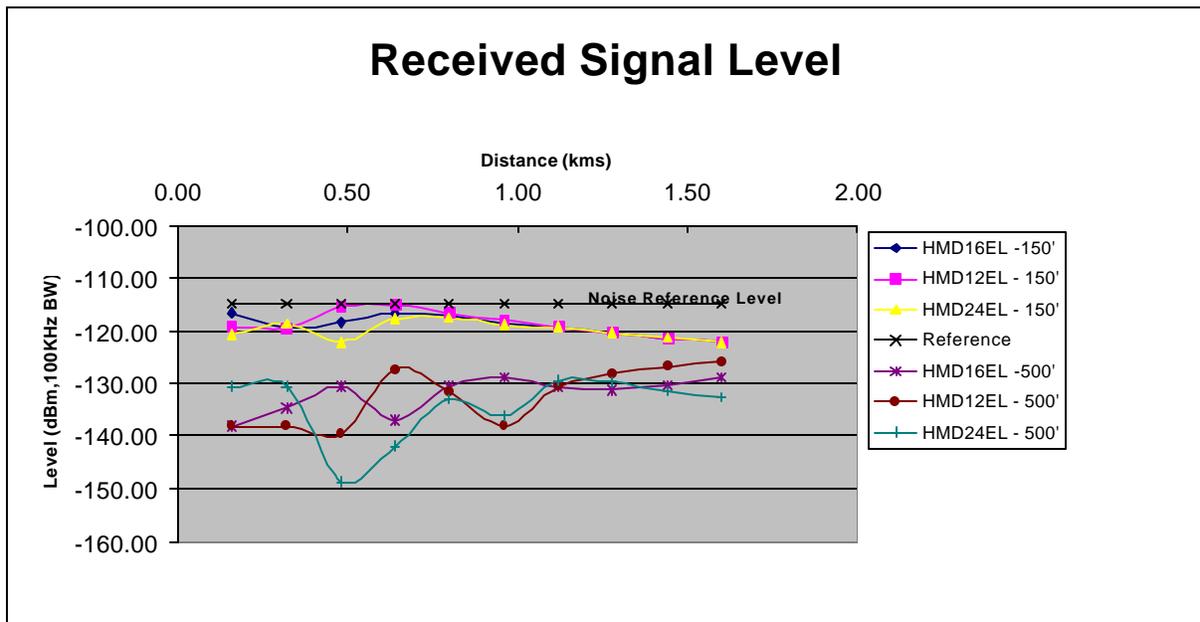


Figure 1

Plotted in Figure 1 is the reference thermal noise level Verizon calculates (-114.85 dBm/100kHz with 9 dB noise figure.) As the chart shows, the MDS interference levels are always at or significantly below the noise floor.

The second incorrect assumption Verizon makes in its analysis is that the OOB emissions of an MDS downstream transmitter operating in the 2.1 GHz band remain at -60 dB beyond +/- 3 MHz from the channel edge. While that is all that is required under Sections 21.908(a) and (b)(1) of the Commission's Rules, in actuality, the channel filters on MDS downstream transmitters in the 2.1 GHz band continue to roll off significantly. At +/- 5 MHz the OOB emissions are at -67 dB and at +/- 10 MHz the response is down to -80 dB. Therefore, if Sections 21.908(a) and (b)(1) were revised to reflect actual MDS OOB emission performance, then an additional 7 dB of isolation would be obtained at all 3G frequencies more than 5 MHz from the 2.1 GHz downstream MDS channel (even ignoring the effect of the elevation angles discussed above).

Conclusion

The analysis submitted by Verizon is overly pessimistic regarding the potential for interference to 3G systems from MDS in the 2150 to 2162 MHz band. As has been shown in this analysis, (1) the elevational characteristics of MDS transmit antennas and (2) the actual performance of 2.1 GHz MDS transmitter filters will allow 3G systems to utilize the vast majority of the 2110-2150 MHz band.

**APPENDIX B
PROPOSED RULE REVISIONS**

1. Section 21.908 should be revised as follows:

(a) The maximum out-of-band power of an MDS station transmitter or booster transmitting on a single 6 MHz channel with an EIRP in excess of -9 dBW employing analog modulation shall be attenuated at the channel edges by at least 38 dB relative to the peak visual carrier, then linearly sloping from that level to at least 60 dB of attenuation at 1 MHz below the lower band edge and 0.5 MHz above the upper band edge, then attenuated along a linear slope to at least 67 dB at 5 MHz above the upper and below the lower licensed channel edges, then attenuated along a linear slope to at least 80 dB at 10 MHz above the upper and below the lower licensed channel edges, and attenuated at least ~~80~~60 dB at all other frequencies. The maximum out-of-band power of an MDS station transmitter or booster transmitting on a single 6 MHz channel or a portion thereof with an EIRP in excess of -9 dBW (or, when subchannels are used, the appropriately adjusted value based upon the ratio of the channel-to-subchannel bandwidths) employing digital modulation shall be attenuated at the 6 MHz channel edges at least 25 dB relative to the licensed average 6 MHz channel power level, then attenuated along a linear slope to at least 40 dB at 250 kHz beyond the nearest channel edge, then attenuated along a linear slope from that level to at least 60 dB at 3 MHz above the upper and below the lower licensed channel edges, then attenuated along a linear slope to at least 67 dB at 5 MHz above the upper and below the lower licensed channel edges, then attenuated along a linear slope to at least 80 dB at 10 MHz above the upper and below the lower licensed channel edges, and attenuated at least ~~80~~60 dB at all other frequencies. Notwithstanding the foregoing, in situations where an MDS station or booster station transmits, or where adjacent channel licensees jointly transmit, a single signal over more than one contiguous 6 MHz channel utilizing digital modulation with an EIRP in excess of -9 dBW (or, when subchannels or superchannels are used, the appropriately adjusted value based upon the ratio of 6 MHz to the subchannel or superchannel bandwidth), the maximum out-of-band power shall be attenuated at the channel edges of those combined channels at least 25 dB relative to the power level of each channel, then attenuated along a linear slope from that level to at least 40 dB at 250 kHz above or below the channel edges of those combined channels, then attenuated along a linear slope from that level to at least 60 dB at 3 MHz above the upper and below the lower edges of those combined channels, then attenuated along a linear slope to at least 67 dB at 5 MHz above the upper and below the lower licensed channel edges, then attenuated along a linear slope to at least 80 dB at 10 MHz above the upper and below the lower licensed channel edges, and attenuated at least ~~80~~60 dB at all other frequencies. However, should harmful interference occur as a result of emissions outside the assigned channel, additional attenuation may be required. A transmitter licensed prior to November 1, 1991, that remains at the station site initially licensed, and does not comply with this paragraph, may continue to be used for its life if it does not cause harmful interference to the operation of any other licensee. Any non-conforming transmitter replaced after November 1, 1991, must be replaced by a transmitter meeting the requirements of this paragraph.

(b) A booster transmitting on multiple contiguous or non-contiguous channels carrying separate signals (a “broadband” booster) with an EIRP in excess of -9 dBW per 6 MHz channel and

employing analog, digital or a combination of these modulations shall have the following characteristics:

(1) For broadband boosters operating in the frequency range of 2.150-2.160/2 GHz, the maximum out-of-band power shall be attenuated at the upper and lower channel edges forming the band edges by at least 25 dB relative to the licensed analog peak visual carrier or digital average power level (or, when subchannels are used, the appropriately adjusted value based on upon the ratio of the channel-to-subchannel bandwidths), then linearly sloping from that level to at least 40 dB of attenuation at 0.25 MHz above and below the band edges, then linearly sloping from that level to at least 60 dB of attenuation at 3.0 MHz above and below the band edges, then attenuated along a linear slope to at least 67 dB at 5 MHz above the upper and below the lower licensed channel edges, then attenuated along a linear slope to at least 80 dB at 10 MHz above the upper and below the lower licensed channel edges, and attenuated at least ~~80~~60 dB at all other frequencies.